NOTES de RECHERCHES

THE ATLANTIC FISHERIES AND COMMUNITY DEVELOPMENT: A CONCEPTUAL FRAMEWORK.
The case of Nor[illegible]st New Brunswick

by

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July 1984

$3.50 45

RESEARCH NOTES

Department of GEOGRAPHY

Département de GÉOGRAPHIE

UNIVERSITE d'OTTAWA UNIVERSITY of OTTAWA

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ABSTRACT

Geography has contributed little to the study of fisheries. Yet, they are economic and social mainstays of certain areas in Canada, especially in the Atlantic provinces. They are also an activity in difficulty that poses problems of resource conservation, economic rationalization, and social and regional development. After a brief review of the approaches and contributions of economics and anthropology, and of the geographical literature, a production system approach to the fisheries is proposed, and a conceptual framework stressing the functions of fishing communities is presented. Using the example of selected fishing communities of North East New Brunswick, possible applications of such an approach are discussed.

RESUME

La géographie a peu étudié l'activité halieutique, et, cependant, la pêche est un pilier économique et social de certaines régions canadiennes, notamment des provinces atlantiques. Mais la pêche commerciale dans ces régions est en difficulté et pose des problèmes de gestion des ressources halieutiques et de rationalisation économiques, liés à des questions de développement social et d'aménagement régional. Après un bref examen des contributions de l'économie et de l'anthropologie, une approche géographique reposant sur la notion de système de production halieutique est proposée. Un schéma conceptuel mettant l'accent sur la place et le rôle des communautés de pêche est présenté. L'exemple de certaines communautés de pêche du nord-est du Nouveau-Brunswick sert à démontrer son utilisation possible.

ACKNOWLEDGEMENTS

We should like to thank Tom Wise and Tom Poetschke, of the Economic Policy Branch, Department of Fisheries and Oceans, Ottawa, for their cooperation and assistance.

Gastien Godin, of the 'Association des pêcheurs professionnels du Nord-Est', Réginald Comeau of the 'Association des pêcheurs côtiers', Paul Boudreau of the 'Coopérative des pêcheurs de l'Île', and Prof. Samuel Arsenault, Université de Moncton, provided valuable information, and made arrangements for visits and interviews in North-East New Brunswick.

INTRODUCTION

Canada's coastal waters contain some of the best fishing grounds in the world, and Canada is the world's largest fish exporter (Bryan 1982). Even though they do not loom large in the national economy, and generate only 1% of GNP, they are a major resource in the Atlantic provinces, and important contributors to the provincial economies. Table I gives the value of fish landings in these provinces in the recent past. (See appendix 1)

The fisheries can be of substantial local and regional importance. For example, the Economic Council of Canada estimates that, during the seventies, 75% of communities along the Atlantic coast had some ties with the fisheries (ECC 1981). They are also one of Canada's oldest staples, and have made the longest contribution to economic and regional development (Draper 1981; Copes & Steed 1975).

The fisheries in general, and the Atlantic fisheries in particular, are beset of difficulties which pose serious economic, resource management, and regional development problems. The widely publicized Kirby Report represents the latest attempt to improve the economic viability of an activity which is of vital importance to many producers and communities of the Atlantic region (Task Force on Atlantic Fisheries 1982).

Despite their importance and impact on regions, geography's contribution to research on the fisheries and on fisheries management has been slight. This paper, after a brief review of the approaches and contributions of some of the social sciences and geography, will propose a geographic approach to the study of the fisheries, and a conceptual framework for research into certain aspects of the Atlantic fisheries.

THE FISHERIES, THE SOCIAL SCIENCES, AND GEOGRAPHY

The fisheries represent major areas of interest and research in certain of the social sciences. Economics and anthropology, especially, have made significant contributions to an understanding of the ways in which fishermen manage their relations to marine resources, and well-established fields of fisheries economics and maritime anthropology have developed.

Fisheries economics developed in response to the difficulties encountered by many sectors of fisheries production. The economic analysis of fisheries is concerned with stocks of fish, and the enterprises that have the potential of exploiting them (Anderson 1977). It places emphasis upon the relationship between biological and economic characteristics, between the population dynamics of fish stocks, and the fishing effort, catch, costs and revenues of enterprises (Anderson 1977). Fisheries economics stresses the common-property and open-access nature of marine fisheries, and supposes a type of behaviour on the part of fishermen which leads to resource depletion and economic inefficiency (Gordon 1954). It is assumed that, in the absence of property rights, fishermen lack self-regulating mechanisms and motivations. This explains the financial plight of fishermen, excess capacity, and the tendency to over-exploitation in open-ocean fisheries, and the necessity for regulation from above (Copes 1983). The economic model has provided a general framework from which fisheries management programmes appear, whose objectives are the improvement of the efficiency of the industry and of fishermen's incomes, and the protection of the resource (Sinclair 1978). Scott has provided a good account of the main themes in fishery economics, and of the development of economic theory on fisheries regulation (Scott 1979).

Anthropology has been less directly involved in management issues, but has a long-standing interest in fisheries, and fishing. An early focus was on description of fishing techniques and instruments in primitive societies (Breton 1981). This gave way to greater emphasis upon the relationship between fishing and social organization in general, and it is in this context that a sub-field of maritime anthropology developed. It is concerned with the specificity of fishing as an activity, with the

articulation of factors of production in the fisheries, and with the social, cultural, and economic life and organization of fishing communities (Breton 1981). One of the findings of maritime anthropology has been that fishermen, contrary to the assumption made in the economic model of fisheries, may regulate the environmental and economic systems of which they are a part, and that some communities of fishermen do have ways of modifying the common-property and open-access nature of marine resources (McCay 1978). Acheson's study of the lobster fisheries of Maine, in which he examines the establishment of exclusive territorial rights over the fishing grounds, is a good example of the management of fishing space by fishing communities themselves (Acheson 1975). Of interest to geography is the fact that this corresponds to the creation of a form of territorial organization which affects the fishing effort, and represents in fact a form of spatial management.

In contrast, as Draper pointed out recently, geographers have neglected the fisheries (Draper 1981). This is not a new situation. Twenty years ago, for example, Padgett expressed the hope that greater concern and effort would be accorded the neglected subject of fisheries (Padgett 1964). A search of the recent North American and European literature has yielded scant results, however.[1] Except for the work of a small group of French geographers, there is no sign of sustained research activity.[2] The few publications that do exist deal with several themes. Descriptive studies of the physical setting, the characteristics of fish stocks, vessel and port characteristics, methods of catch, production and commercial aspects of fisheries, as well as the problems confronting them, predominate (Alford 1975; Black 1960; Carré 1982, 1980, 1978; Carrière 1975; Chaussade 1975; Corlay 1980, 1978, 1976; Coudé 1975, 1974; Craig 1969; Doumenge 1980; Fournet 1980, 1979, 1978, 1975; Helin 1964; Padgett 1966, 1964, 1963; Pinard 1976; Pinot 1980; Power and Lejeune 1976). Fisheries development, fisheries management, fishing settlements, conflicts with other resource uses, international aspects of fisheries, social and dietary implications of technological change in fishing, are other themes that have been explored (Alexander 1977; Alford 1973; Carré 1975; Copes & Steed 1975; Dickinson 1974; Karamysheva 1974; Marts & Sewell 1960; Mitchell 1977, 1976; Robinson 1975; Ross 1971).

Canada's fisheries are almost totally absent from the geographic literature. It is interesting to speculate upon the reasons for this relative neglect. In part it may stem from the fact that the effects of the fisheries on the geographic spread and growth of settlement and income were relatively weak. Even though the fisheries were the first staple in Canada's development, and the sole economic base in certain areas, they did not stimulate as much settlement, or agricultural expansion, as the other staples (Marr & Paterson 1980). Furthermore, the pattern of fishing settlement is discontinuous; fishing communities are strung out like beads at irregular intervals on the margins of coastal regions. By their very nature they have had an off-shore orientation, and did not develop strong links with the interior. This is especially true where the inshore fisheries are dominant, since their technical, material, and labour requirements were relatively small. Small fishing communities often exist in isolation, and, until recently in many areas, were more easily accessible by sea than by land (Andersen & Wadel 1972). The rôle of the fisheries in regional formation and spatial organization was relatively weak, therefore. This may explain why they attracted little attention from a discipline that is concerned with the analysis of space and place interrelationships, with spatial interaction and locational interdependencies. Furthermore, in Canada the fisheries are an activity that is characteristic of the periphery. Most geographic research has been directed to the problems of the urban-industrial core. Interest in the coastal zones grew when their resource potential became attractive to the core, when mineral and oil exploration became vital to the industrial economy. This was accompanied by growing concern over disparities in patterns of regional development between the core and the periphery. Resource management and regional development issues have generated new interest in the geographic study of marine resources, including the fisheries, and resource geographers have renewed the call for greater involvement by geographers in the study of Canada's ocean fisheries (Draper 1981).

A GEOGRAPHIC APPROACH TO THE FISHERIES

Fisheries economics is primarily concerned with fishing effort and catch, and with fish stocks. Maritime anthropology focuses on communities

and cultures in a maritime environment. A geographical approach to the fisheries, and to fisheries management, should emphasize the total production system, and the place and function of fishing communities within the system. The notion of production system in economic geography is not new. Tornqvist used the concept to illustrate information flows and inter-dependencies of manufacturing activities, and to show that economic activities require a combination of physical facilities, equipment, and people at different places, doing different things at different times (Tornqvist 1977). Corlay has depicted off-shore fisheries as halieutic systems composed of biological, technical, economic, social, cultural and legal elements (Corlay 1979). A halieutic system generates a halieutic space, which is a geographical structure extending over land and sea. Corlay uses these concepts to analyze and compare the relative importance of catch in Danish fishing zones (Corlay 1979). The approach that is proposed here is an extension of these ideas. It stresses the interrelationships and interdependencies that characterize fishing as an activity, and emphasize the coordination and cohesion of the elements of the system in space and time. In so doing it draws attention to the rôle of communities in the system.

A fishery is a production system consisting of three interrelated components, or sub-systems: an activity space, a community space, and a commercial space (figure 1). The activity space is the domain of harvesting of the resource, and consists of the segment of the marine environment that is effectively exploited by a fishery. Its extent and contours vary according to variations in the characteristics of the fishery and the marine environment. It is a nodal space whose foci consist of handling and processing facilities. These constitute the links, through which materials, products and information flow between the activity space, and the community and commercial spaces.

The community space comprises the production infrastructure, processing activities, and related infrastructures and services. It provides the labour force for the fishery. The community space consists of one or more settlements organized around landing and processing facilities and activities. These settlements are linked through a same resource base to the activity space, but may fulfill different functions in the production cycle. In addition to production facilities, the community space will comprise social

CONCEPTUAL FRAMEWORK: FISHERY PRODUCTION SYSTEM

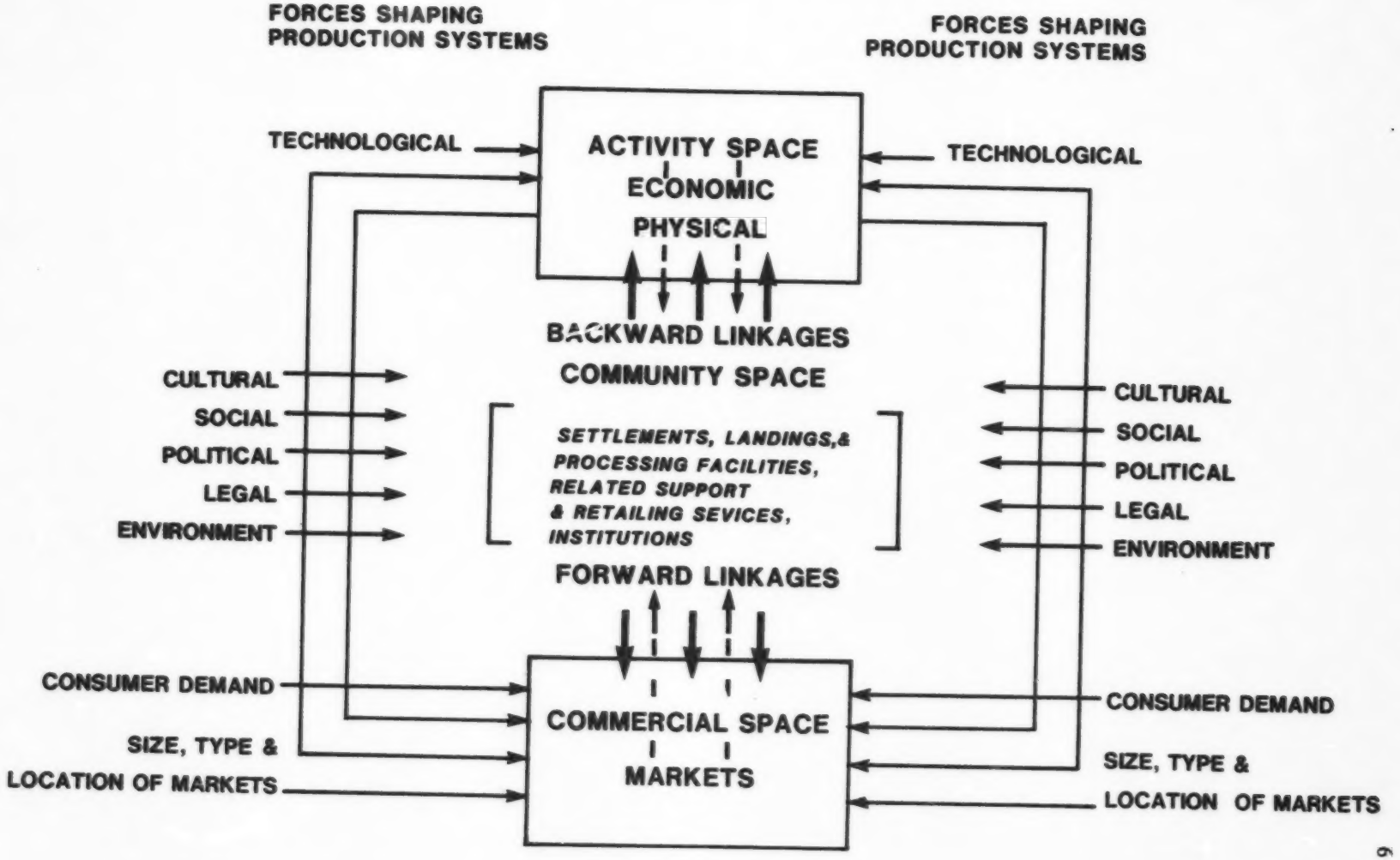

FIGURE 1

services and commercial facilities. Its internal structure and cohesion will tend to be stronger in areas characterized by the absence of alternative sources of employment. Organizations such as unions, associations, and cooperatives reinforce the cohesion of the community space, and the degree of identification of the residents with their space. Poetschke has pointed out that communities constitute the basic social unit within which fishing takes place (Poetschke 1983). The community space is the basic element in the spatial organization of the fishery, and the basic unit for geographical analysis.

The commercial space consists of markets to which the output of the production system is directed. It is linked to the activity and community space by the flow of products, revenue and information, through channels of transportation and communication.

The temporal element takes on a particular aspect in the case of the fisheries, and must be considered when examining the production system. Contrary to many urban, industrial, and even resource activities whose movements and flows show distinct cycles of short periodicity, and whose directions are relatively stable and easy to define, harvesting and processing in the fisheries are often characterized by relatively short periods of intense activity, broken by long periods of inactivity, depending on the nature of the fishery and its location. In other words, the activity space has an intermittent and irregular character. This has important repercussions on the community space, on its cohesion and organization.

From a geographical point of view this approach has the advantage of showing that fisheries structure coastal areas through a series of interdependencies and linkages, that they are factors in spatial organization. It indicates that the structure and level of development of fisheries settlements and communities depend upon their relationships to other elements of the fisheries production system, and to elements outside the system. It incorporates change, and the impact of change upon communities. This appears especially important when one considers the rapid changes that have occurred, and continue to occur, in the Atlantic fisheries of Canada, for example

(Wynn 1982; Staveley 1982). Geographical concepts of spatial differentiation, settlement structure and hierarchy, functional organization, become useful tools in the study of fisheries. An examination of the fishing industry in North East New Brunswick will illustrate some aspects of the production system, and of community space and its determinants.

THE FISHING INDUSTRY IN NORTH EAST NEW BRUNSWICK[3]

There are over 290 fishing communities in New Brunswick. More than half (148) are located along the North East coast of the province (DREE 1976) (figure 2). These communities are small, often with less than 1000 inhabitants, and heavily dependent upon fisheries for their livelihood. Their origins date back to the resettlement of the Acadians in the early 1700's, and they have remained francophones, with high French to English ratios. Their activity spaces lie in Chaleur Bay, the Gulf of St-Lawrence, and Northumberland Strait. Recent attempts at rationalization of the location of wharves and landing sites have modified the distribution of focal points in the activity spaces, and have induced change in the community spaces.

Historical, cultural, and environmental characteristics differentiate the fishing communities of North East New Brunswick. Three other factors appear to play an important rôle: processing plants, the midshore fishery, and associations and cooperatives. Communities with processing plants tend to be better off economically since the plants are a major source of employment for women. Table II indicates that women constitute more than 60% of the work force in plants in selected communities (see appendix I). A large proportion of the work force, as in Lamèque for example, is composed of relatives of fishermen, reinforcing the cohesion of the community. The plants also require support services and activities, and provide spinoffs.

Three types of fisheries operate in North East New Brunswick: offshore, midshore, and inshore. The distinction between types is based not only upon physical or geographical characteristics, but upon vessel size and what Macdonald has termed the "rather nebulous criterion of concentration of political and/or economic power in the fisheries sector" (Macdonald 1979).

THE MARITIME PROVINCES

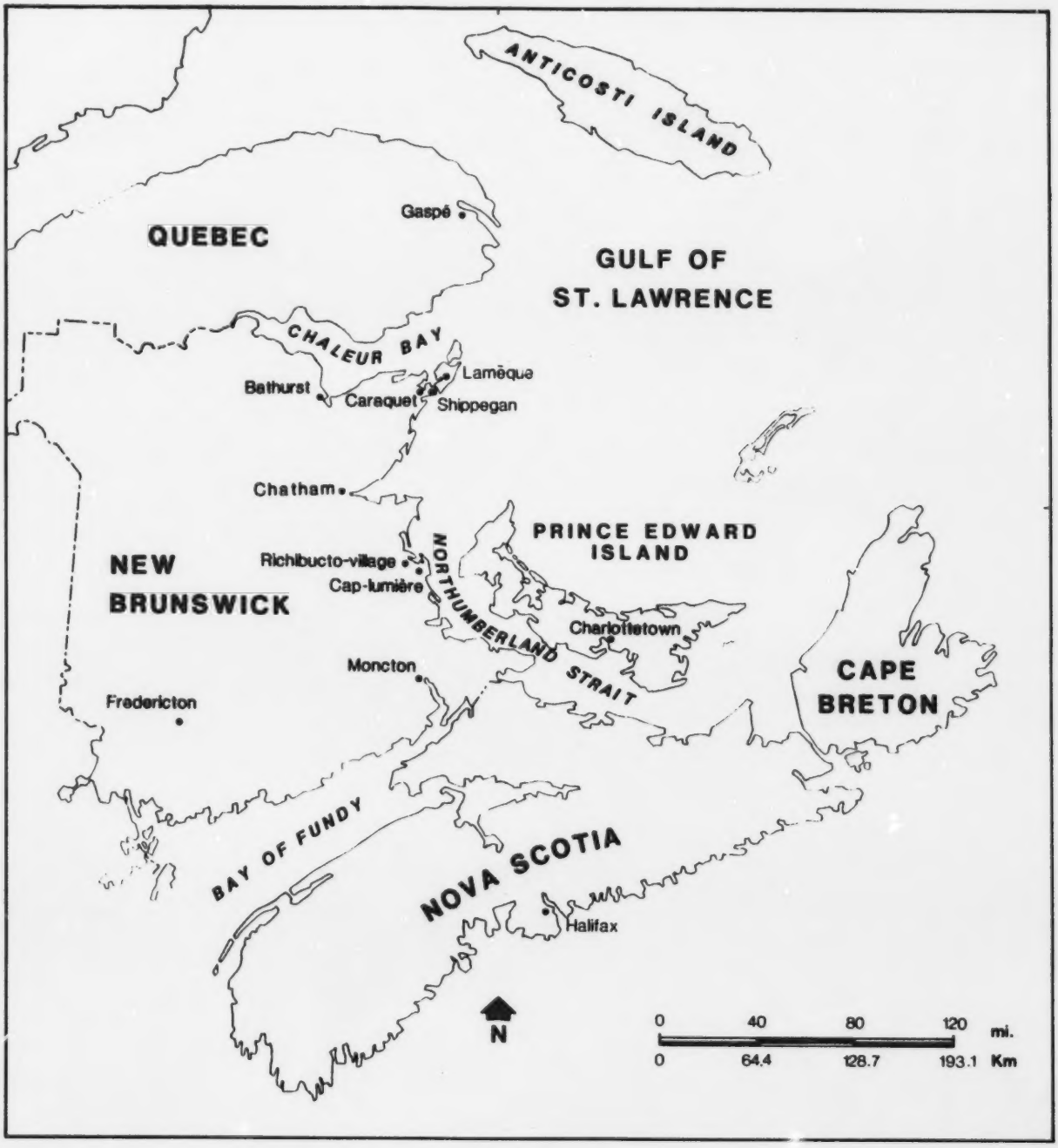

FIGURE 2

The midshore fishery emerged as a major force in the industry with the establishment of the 200-mile fisheries zone in 1977. The midshore fishermen are well organized and represented by an articulate and well-informed association, the North East Professional Fishermen's Association. They are based principally in the Caraquet-Lamèque-Shippegan region, where they number more than 50% of all fishermen, and account for 40% of vessels (Table I). The midshore fishermen, unlike their inshore counterparts, are not simply "price takers", but can negotiate attractive prices for their catch. They have some market power in the region. It has been suggested that the growth and prosperity of Lamèque is closely related to the midshore fishery, and midshore fishermen are referred to, in the area, as "Cadillac fishermen". The inshore fishermen are more dispersed, in settlements like Richibucto Village, or Cap Lumière, where 85% of fishermen are full-time inshore, where unemployment is high, social services poorly developed, and education and health care must be obtained outside the community. In North East New Brunswick offshore fishermen are in the minority; offshore vessels are owned by the processing plants.

In New Brunswick, as elsewhere, a number of associations, unions, and cooperatives seek to organize production, and fishermen of different types in different regions.[4] Cooperatives represent an organizational form in which fishermen pool their resources and establish processing and servicing facilities. Unions and associations defend the interests of their members in the management of the fisheries. In the North East, the North East Professional Fishermen's Association has organized the midshore fishermen, while inshore fishermen are grouped within the Union of Maritime Fishermen. Unions and associations do not influence community structure directly, but indirectly through their support of cooperatives, and through their influence in fisheries management and regulation policies. Cooperatives, for example, can influence the structure of community space by promoting concentration of landing and processing facilities. Ports where cooperatives are located act as nodal points to which fishermen bring their catch. If the cooperative is successful, fishermen from surrounding communities may be drawn into joining. Benefits will accrue to the community that is the site of the cooperative; additional services may develop. As employment

opportunities increase due to the presence of the cooperative, and as a work force is drawn from surrounding areas, the community will gain in relative importance and will dominate surrounding communities. This can lead to shifts in facilities, services and population among settlements. The development of higher order services and infrastructures in the nodal community will increase its attraction for surrounding populations (Poetschke 1982, 15). To a certain extent this has occurred on Shippegan Island, where Lamèque is situated. The major employer is the cooperative which is owned by local fishermen, and which has 1000 employees drawn exclusively from the Island; Lamèque has become the principal centre.

Table III summarizes the social and economic characteristics of four communities that were examined (see appendix 1). Richibucto Village is dependent upon the inshore fishery. In 1981 it had male and female unemployment rates of more than 19%,, the lowest participation rates, and the lowest income of the four communities. It was the only community to experience a drop in population from 1976 to 1981. The relative stability and economic health of the other three are reflected by the positive migration balance, and number of paid workers in other sectors of the local economy.

CONCLUSION

Policies designed to restructure the Atlantic fisheries have been directed primarily at the activity space. The discussion of the fisheries of North East New Brunswick indicates the interdependency of activity and community space, and demonstrates that fishing communities have specific characteristics that differentiate between them. Any exercise in restructuring fisheries, therefore, should also be directed to the community space. Even though policies with broad regional and provincial applications have definite advantages, sub-regionally specific policies tailored to different community spaces in different provinces should be considered. The definition of viable sub-regions, and the functional restructuring of clusters of communities in terms not only of the fisheries, but of other types of activities and opportunities, require a better understanding of the structure

and determinants of community space, and information and data on its components. The proposed conceptual framework provides a basis for detailed community surveys.

The production system approach, with its emphasis on community space, offers new perspectives on fisheries management and regional development. Fisheries management policies, based on economic and biological considerations, have tended to stress economic efficiency and resource conservation (Needler 1979). They apply especially to the activity space. These policies also affect communities, however, and policy choices can drastically alter social conditions in fishing communities, and have lasting differential effects on regions. To a greater extent, social equity, as well as economic efficiency, will have to be considered by policy makers (Draper 1981; Poetschke 1983, 3). Like social equity, regional development is an issue that concerns primarily the community space. One of the objectives of restructuring community space could be to maintain the traditional fishing activity in small settlements whose populations manifest a high degree of community attachment, while integrating them more effectively into a wider community possessing a greater variety of services, facilities and infrastructures, thus creating a more attractive environment for economic diversification and alternative sources of employment. This could be particularly important in areas like North East New Brunswick, whose Acadian population is profoundly community-oriented, and where rural resettlement schemes have generally met with failure (Vernex 1979, 134). In that respect, the rôle of associations and cooperatives should be stressed. These forms of organization have produced good results in communities like Lamèque, and might play an effective part in the diversification of communities, and in regional development programmes. Local cooperatives, for example, could participate in the development of other local and regional resources. Unless we have a better understanding of the interdependencies within and between communities, of the linkages between elements of the production system, it will be difficult to assess the impact of policies on communities and community space. Research into the nature and structure of community space, and into the identification of criteria which can be used to define functional and regions is required.

The Kirby Report proposes to restructure the Atlantic fisheries, and rationalize fishing effort, processing and commercialization (Task Force on Atlantic Fisheries 1982). It supposes that social and economic well-being of communities would follow. It is an approach that puts the emphasis on the industry, and that considers that beneficial effects will trickle down into fishing communities. Past experience indicates that this may not be the case. The production systems approach stresses the interdependencies between elements of the fisheries and suggests that the restructuring of the industry and of communities should go hand in hand.

APPENDIX 1

TABLE 1- Value of fish landings.
Atlantic Provinces 1980-1983

	Value of landings*			
	1980[1]	1981[1]	1982[2]	1983[2]
New Brunswick	36.8	44.4	57.8	76.0
Nova Scotia	181.2	208.5	225.2	242.8
Prince Edward Is.	24.0	27.0	31.9	40.8
Newfoundland	109.4	123.5	164.5	161.9

* In millions of dollars

1. Jan. - Oct.
2. Jan. - Nov.

Source: Toronto Globe and Mail, Report on Canada 1, Jan. 25, 1982
Report on Canada 1, Jan. 23, 1984

APPENDIX I

TABLE II- The Fishing Industry in Selected Communities in North East New Brunswick. 1983

	CARAQUET	LAMEQUE	RICHIBUCTO	SHIPPEGAN
No. of fishing plants	3	1	4	6
Peak employment in plant(s)	340	1000	374	2515
Percentage of women in plant workforce	83	60	68	73
No. of inshore vessels	134	62	88	110
No. of midshore vessels	78	42	0	41
No. of offshore vessels	19	5	0	10
No. of inshore fishermen	309	163	176	113
No. of midshore fishermen	578	215	0	155
No. of offshore fishermen	107	36	0	54
Percentage of full-time fishermen	70	78	95	75

Source: Based on data collected during field work in North East New Brunswick, September 1983.

APPENDIX 1

TABLE III- Social and Economic Indicators for Selected Communities in North East New Brunswick. 1981

	CARAQUET	LAMEQUE	RICHIBUCTO VILAGE	SHIPPEGAN
Population: 1981	4315	1571	1722	2471
1976	3950	1443	1909	2344
Mother tongue:				
English	230	60	425	75
French	4010	1565	1290	2145
No. of in-migrants	625	185	205	285
No. of out-migrants	525	195	475	395
Pop. 15 yrs and older	3155	1115	1320	1685
Males employed	900	355	320	560
Males unemployed	155	20	80	60
Male participation rate (%)	67.3	66.1	62.8	77.5
Male unemployment rate (%)	14.6	5.4	19.8	9.7
Average male income ($)	11,865	11,828	11,109	12,452
Female employed	710	265	225	425
Female unemployed	130	40	60	60
Female participation rate (%)	53.2	54.1	41.8	54.5
Female unemployment rate (%)	15.5	13.3	21.4	12.4
Average female income ($)	7,011	7,897	5,762	7,972
INDUSTRY DIVISIONS				
Labour force all industries:	1,855	660	645	1,090
Primary industries	75	65	65	65
Manufacturing	360	170	80	365
Construction	170	35	30	70
Transportation/ Communication	95	----	20	35
Trade	320	95	105	150
Finance/Insurance/ Real Estate	75	15	25	55
Community	615	245	225	275
Public Administration/ Defense	140	35	90	75

Source: Statistics Canada. Census of Canada. 1981.

NOTE

1. The following journals were consulted:
Annales de géographie (to 1974); Annals of the Association of American Geographers (to 1960); Bulletin de Société belge d'Etudes géographiques (to 1974); Cahiers de Géographie de Québec (to 1970); The Canadian Geographer (to 1949); Economic Geography (to 1960); Geografiska Annaler (to 1974); Geographical Bulletin (to 1958); Geographical Review (to 1960); Geography (to 1974); Institute of British Geographers. Transactions and Proceedings (to 1974); Norois (to 1974); The Professional Geographer (to 1960); Regional Studies (to 1966); Canadian Journal of Regional Science (to 1977); Soviet Geography. Review and Translation (to 1974).

2. Much of this work has been carried out under the auspices of a specialized research unit of the "Conseil National de la Recherche Scientifique" (CNRS) of France. This unit conducts research on the geography of the sea and coastal zones of the North Atlantic, and surrounding seas (E.R.A. 345: "Géographie de la mer et des côtes dans l'Atlantique Nord et ses mers bordières". Responsable: A. Guilcher).

3. This section is based, in part, on data and information gathered in N.E. New Brunswick, in September 1983, by students from the department of Geography, University of Ottawa, and on individual reports submitted in December 1983 in the course GEG 4918. The data and information were obtained from questionnaires and interviews, with fishermen, processing plant representatives, union and associations representatives, and local officials. The student participants were: Gaetan Buttigieg, Jean Charbonneau, Tim Colfe, Sylvie Gagné, Bruce Hamilton, Maureen Jedynack, Paul Legros, Réjean Lepage, James O'Brien, Chantal St-Amour, Ivana Scaffardi, Ian Scott, Luc Tremblay.

4. Some of the ideas in this section are drawn from an unpublished paper by James O'Brien, "The Role of Unions, Associations and Cooperatives in Defining Community Structure and Concentration", submitted in GEG 4918, December 6, 1983.

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